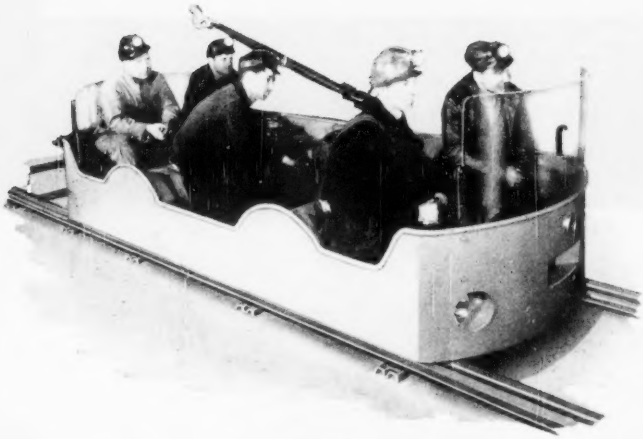
COAL MINING

"The Picture-Book of the Industry"

JANUARY 1950 VOLUME XXVII, No. 1

WHY WALK—



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This machine is specifically built for recovering coal after further strip mining is unprofitable. A three-man crew can easily drill to depths of 100 feet or more. With 16, 20, 24, 30, 36 or 40-inch augers, a McCarthy Drill will produce from 60 to 150 tons of clean coal every eight hours for a total cost, including depreciation, of less than $1.50 per ton! A special steel-geared reduction unit, running in oil on Timken Bearings, transmits power through the heavy-duty transmission. Four speeds forward, one reverse are provided and the carriage travels a distance of eight feet. Over-all dimensions: 6 feet by 14 feet long. Total weight: 4700 to 5000 pounds. See your McCarthy Dealer today or write us direct for information.

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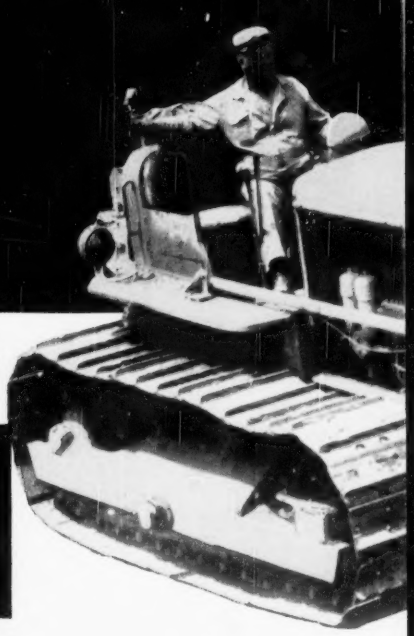

THE SCRAPER . . Heavy, welded box-section construction features "Caterpillar" Scraper design. Behind earth-boiling, soil-heaping loading action is massive frame and chassis strength, for the heaviest condition!

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906 John Street
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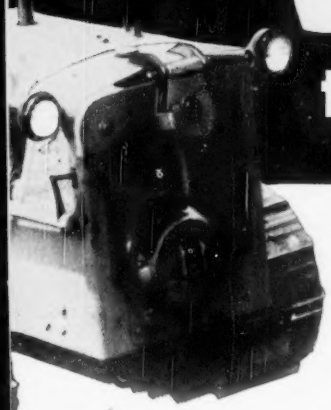
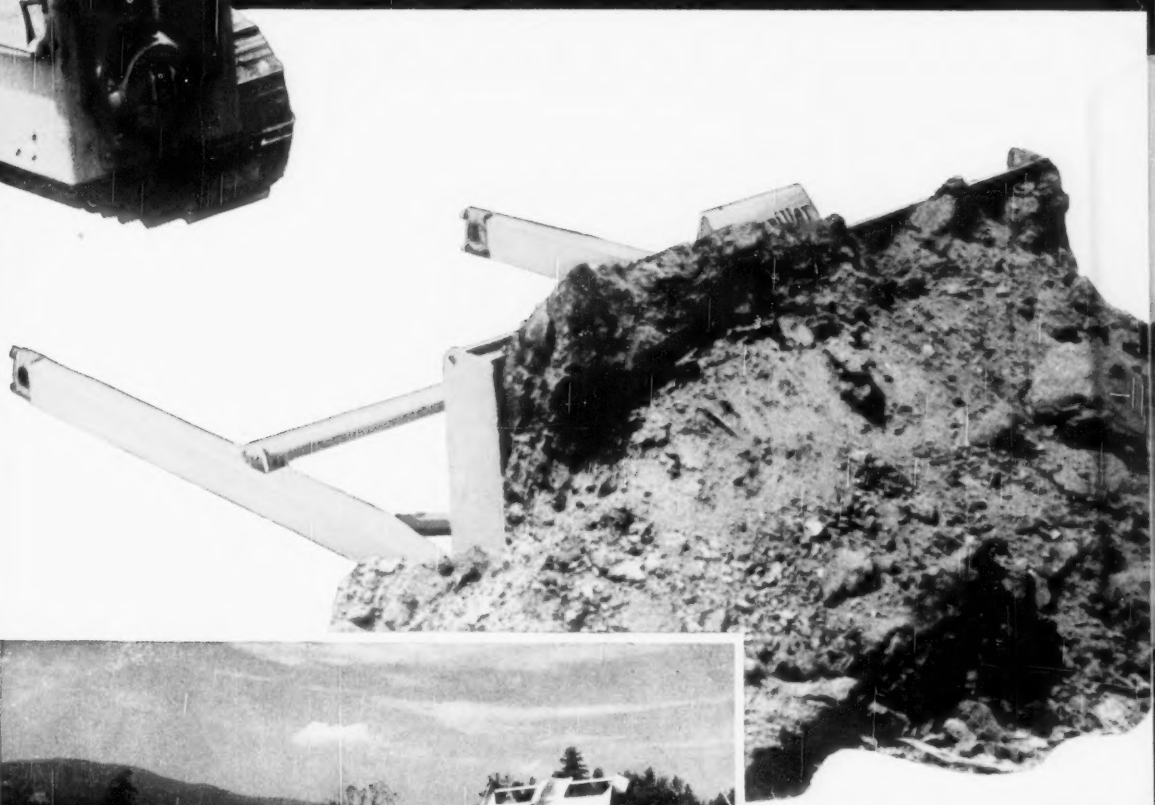
ENGINEERS BOTH ENDS to MATCH the MIDDLE



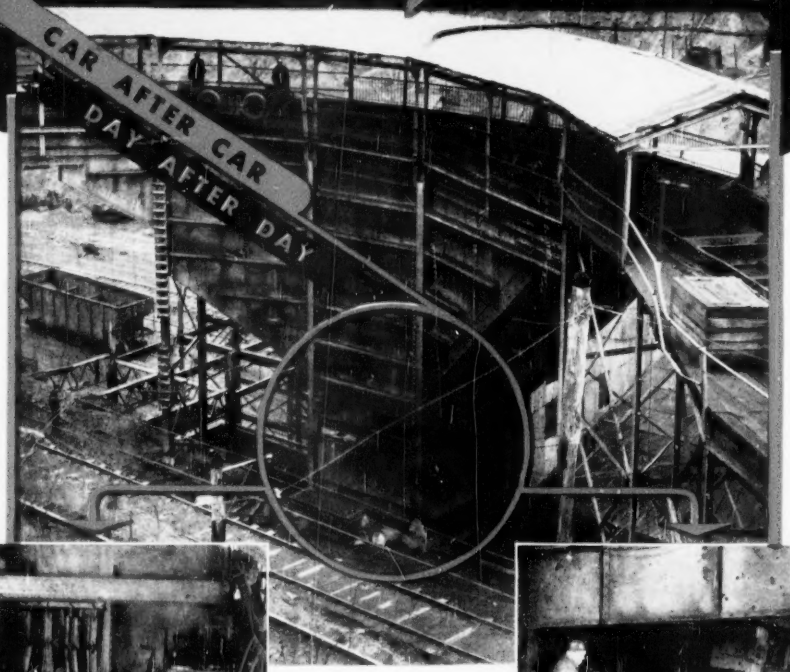


CUSTOMER-KEEPING PERFORMANCE

Into the fill goes another load from the heaped bowl of this "Caterpillar" No. 80 Scraper — matched by "Caterpillar" engineering to fit the power and traction of the "Caterpillar" Diesel D8 Tractor in front.

500 TONS *per hour*

CAR AFTER CAR
DAY AFTER DAY



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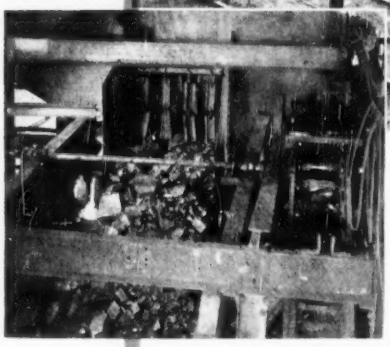
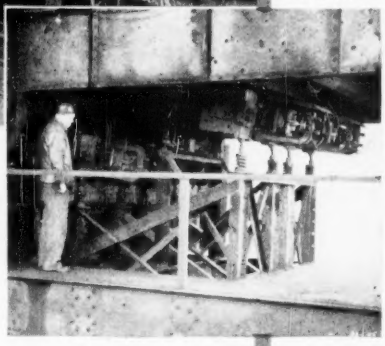


Left—front view of the Jeffrey-Traylor electric vibrating Feeder feeding R. O. M. coal at 500 tons per hour. *Right*—rear view of the same feeder.



Large illustration is a general view of bin showing continuous dumping of mine cars over a 5′ x 10′ Jeffrey-Traylor electric vibrating Feeder . . . thence to shaking screen.

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COAL MINING

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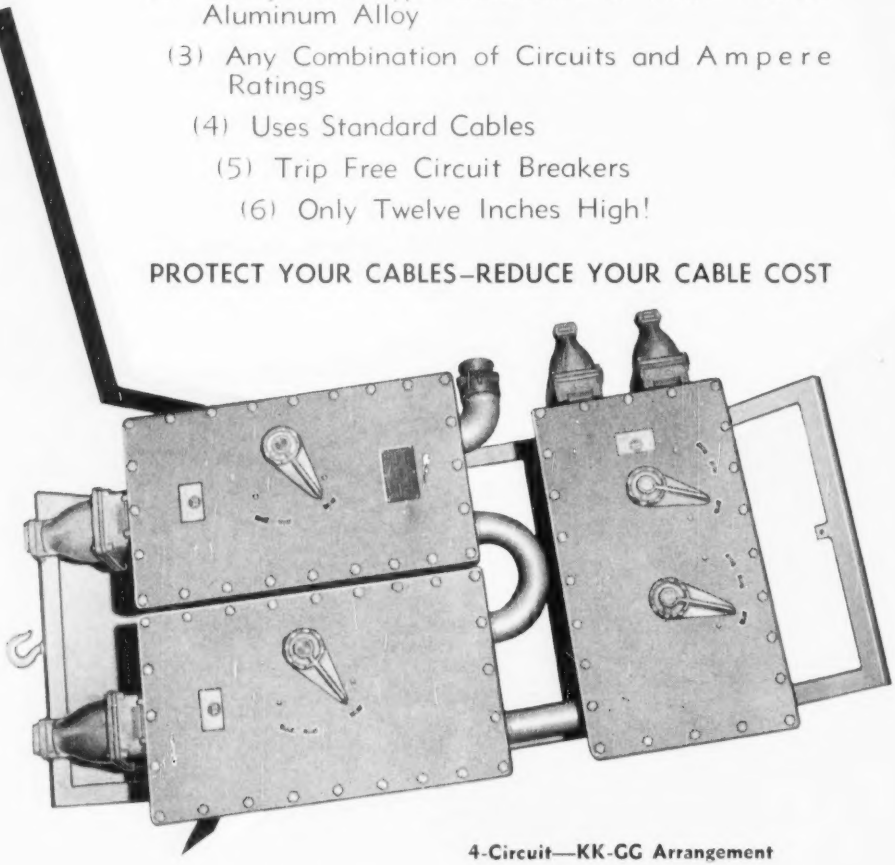

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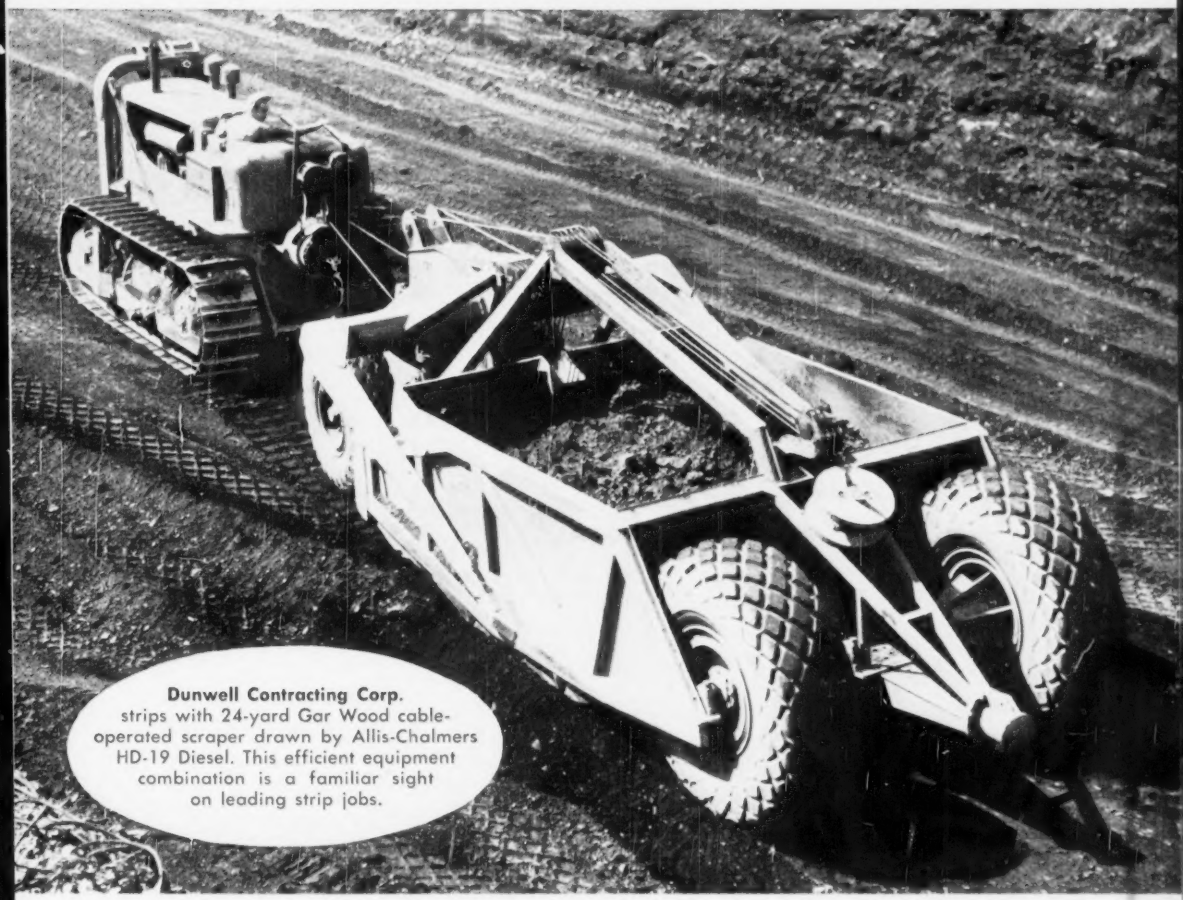

Dunwell Contracting Corp. strips with 24-yard Gar Wood cable-operated scraper drawn by Allis-Chalmers HD-19 Diesel. This efficient equipment combination is a familiar sight on leading strip jobs.

W. O. Gulbranson, Inc. strips overburden near Houtzdale with Lima 1201 and 2½ cubic yard bucket. Limas strip more, dig more, load more!

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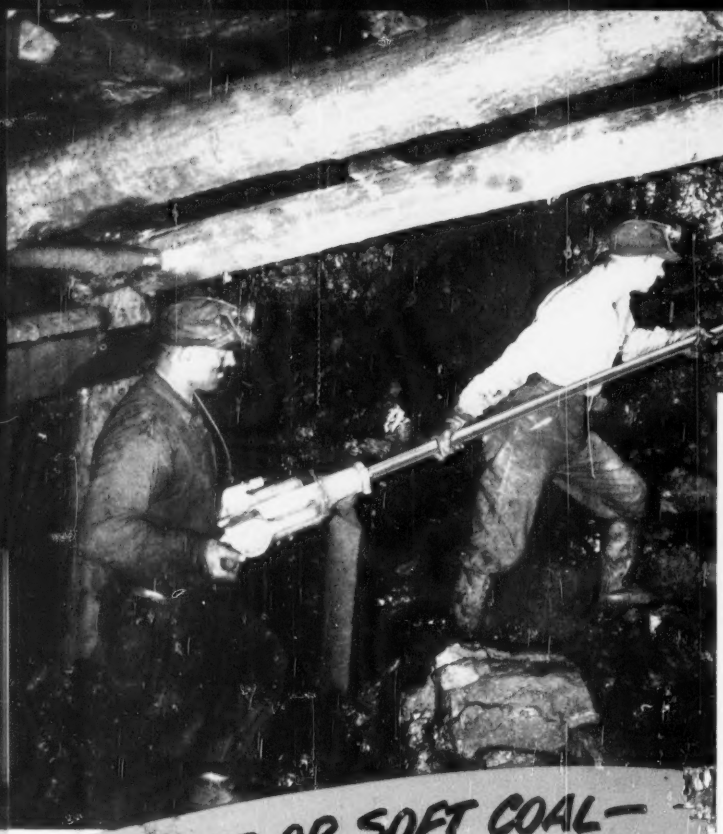

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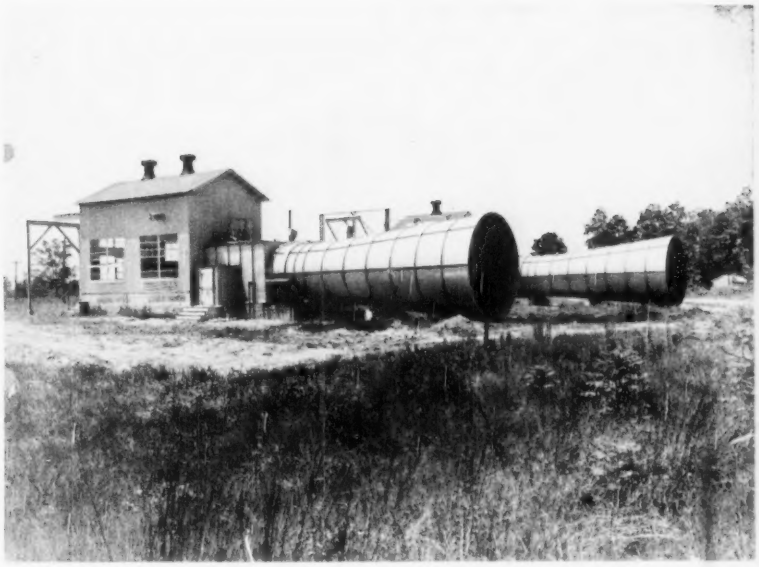
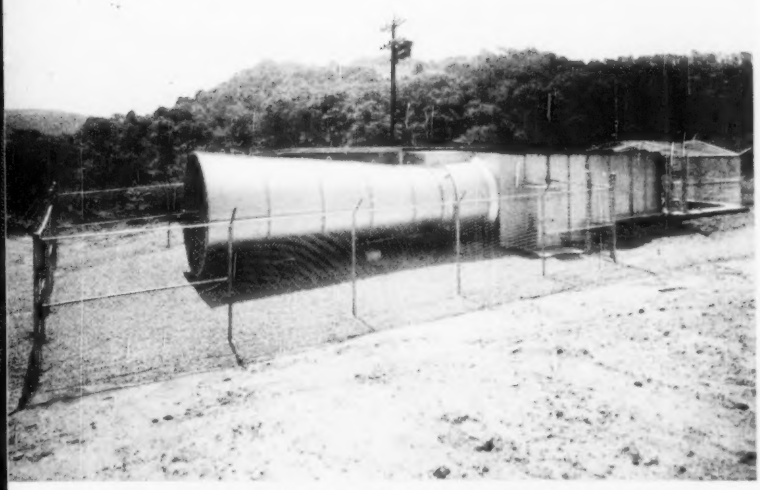


Tamdem Joy Mine Fan Installation in an Alabama Mine.

Ventilation and Other Safety Problems in Connection with Continuous Mining Equipment

By R. T. ARTZ
Mining Engineer, Health and Safety Division, Bureau of Mines, Pittsburgh, Pa.

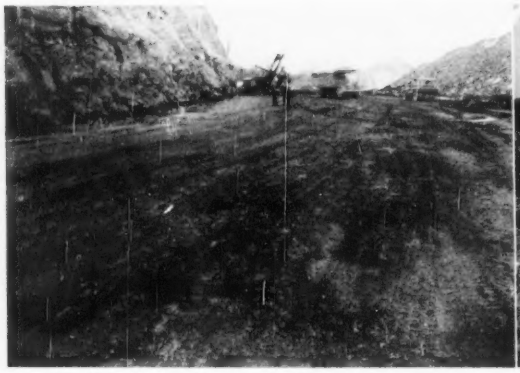


Single Joy Mine Fan Installation in a West Virginia Mine.

Fundamentally the ventilation and other safety problems introduced by the Joy Continuous Miner, the Jeffrey Colmol, the McKinlay Entry Driver, or any of the other lesser known continuous mining machines, do not differ from those posed by other types of equipment used in face regions. However, corrective measures must be applied more promptly than with ordinary mining of bituminous coal because the rate of face advance is much greater. Although the problems are similar, it is important that they be recognized and the corrective measures applied promptly to avert accidents or disasters. A bad accident record may result in legislative action, which could restrict the use of continuous mining equipment or otherwise impose hardships on the industry.

The important problem, insofar as ventilation is concerned, is to sweep the entire face continuously with a current of air, adequate in volume to dilute the methane that

(Continued on Page 23)



A 50 ft. cut of stripped coal, cleared for loading out.

Caterpillar D-8 Tractor, pushing spoil.

Stripping Operation Of the West Virginia-Pittsburgh Coal Co.

The West Virginia Pittsburgh Coal Company strip mine is located in the West Virginia Panhandle about two miles east of Weirton, West Virginia. In this area the Pittsburgh coal seam runs from four and one-half to five and one half feet thick. The terrain has been highly eroded and the coal lies high above valleys made by this erosion.

The area being stripped has previously been deep mined by the West Virginia Pittsburgh Coal Company, and outcrop coal is now being recovered by stripping.

Typical highwall left by stripping shovels, having 45 ft. boom and 2 yard dipper. This highwall is about 55 ft. high.

Mine Office Building.

This is a new type channel iron haulage truck garage.

The Die-el-Driven Walking Dragline with the 5½ yard ESCO bucket.

One of the stripping units working in rock overburden area.

Three shovels having 45 foot booms, 32 foot sticks and 2 cubic yard dippers, and one dragline having a 105 foot boom and a 5½ yard ESCO bucket are used in this strip operation.

The overburden varies from shale to sandstone. Topsoil is very light, and a little farming or grazing has been done in the area being stripped. Drilling of the overburden for shooting is done with Salem vertical drills mounted on halftracks. Augers are 6 inches in diameter and holes up to 80 feet in depth are drilled.

The shovels strip up to 60 feet of overburden, and the dragline moves up to 90 feet of overburden if it is not too rough. Stripping equipment is operated 24 hours a day, seven days a week.

The surface of the stripped coal is cleaned with a LeTourneau Tournadozer, which is also used for making and maintaining haulage roads.

Stripping shovels generally load out the coal they strip. Coal uncovered by the dragline is loaded out with a Lorain 820 shovel, using a 3¼ cubic yard ESCO coal loading bucket.

Close up of the 5½ cubic yard ESCO dragline bucket.

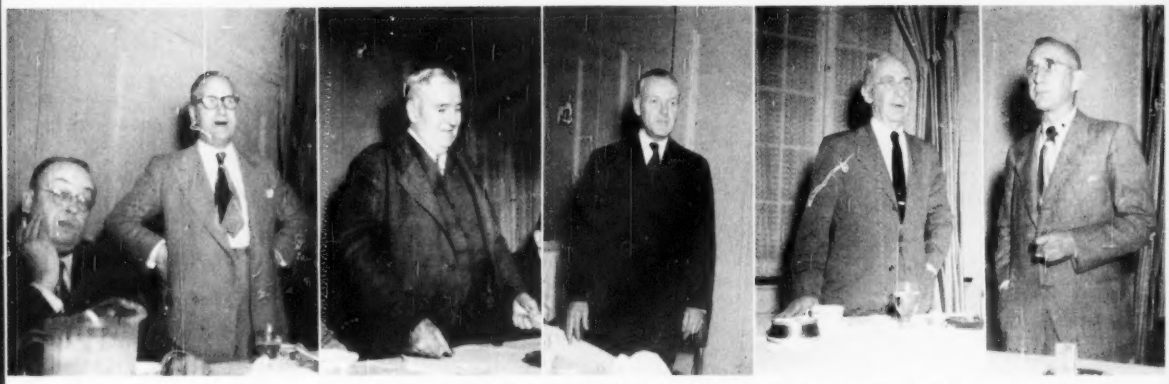
Hauling is done in 15 company-owned trucks; eight of which are fifteen ton trailer-type, and seven of which are ten ton straight-type trucks. The longest haul is seven miles.

The management is of the belief that preventive maintenance is 85% of efficient operation, and has instituted a method of equipment inspection which has resulted in monthly reports showing 92% efficiency in the operation of the equipment.

All coal is hand-picked in a tipple that has been used for deep-mined coal, which was sold to the industrial market only. It was recently decided to sell domestic coal in the local area and domestic coal bins have been installed. Coal for the domestic trade is processed in the tipple, loaded into railroad cars, which are dropped about 150 feet below the tipple, dropped onto a 24 inch cross conveyor which leads onto a 24 inch conveyor for transporting into the domestic coal bins. Domestic coal is weighed on a 16-foot long, 25 ton capacity Bonded Scale.

Turnadozer clearing surface of stripped coal.

A Turnadozer working in pit with the coal loading shovel.

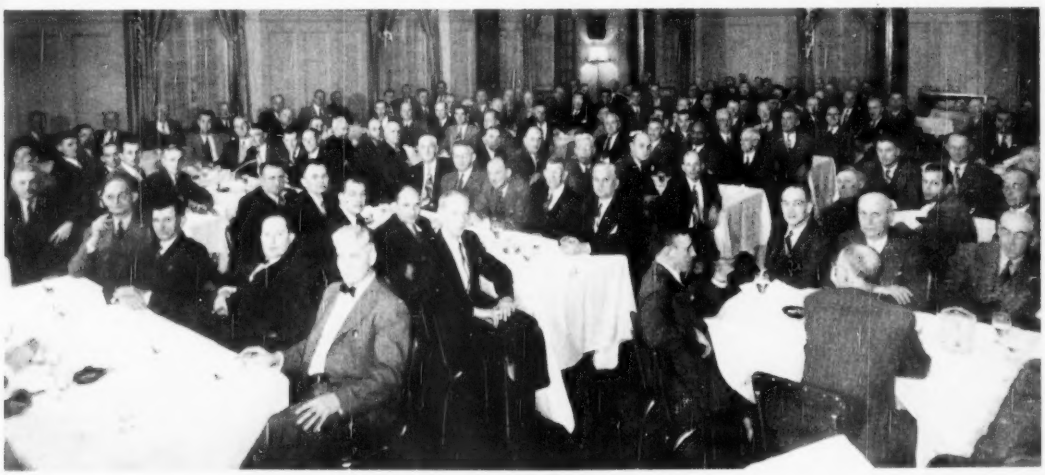


Speakers at the dinner were (1) J. J. Fordes, W. G. Stevenson, Vice President Operations, Hillman Coal & Coal Company and Toastmaster at the Dinner is on the left. (2) Garfield Thomas. (3) M. D. Cooper (4) E. A. Siemon (5) Earl R. Maize.

Mine Safety Course Completed by Officials of The Hillman Coal and Coke Company

One hundred and fifty five officials and non officials of the Hillman Coal & Coke Company celebrated the completion of a Mine Safety Course given by the United States Bureau of Mines. The course was given at several mines of the Hillman Coal & Coke Company. A total of 142 officials started the course and 138 completed it. Forty two non officials started and 17 finished.

A celebration was given to all by the Hillman Coal & Coke Company, starting with an attendance to a professional football game at Forbes Field, Pittsburgh, Pennsylvania, between the Pittsburgh Steelers and the Los Angeles Rams. After the football game, a dinner was served at the Pittsburgh Athletic Assn. under the toastmastership of Mr. W. G. Stevenson, General Manager of Mines, Hillman Coal & Coke Co. Speakers at the dinner were: J. J. Forbes,



View of a Portion of the Men in Attendance.

Chief, U. S. Bureau of Mines, Washington, D. C.; Garfield Thomas, Deputy Secretary of the Pennsylvania Dept. of Mines; M. D. Cooper, Director of Engineering Education for the National Coal Association; E. A. Siemon, Division Superintendent, Hillman Coal & Coke Company, and Earl R. Maize, Safety Director, National Coal Association.

Certificates issued to the foremen by United States Bureau of Mines were presented by Sam P. Polack, who instructed all the classes.

Cash awards for essays in safety were presented to the winners of the various classes by P. J. Callaghan, U. S. Bureau of Mines.

State Mine Inspectors in attendance included J. V. McKenna, William J. Ivill, James Black, and William P. Powers.

This affair served the purpose of recognizing the accomplishments of the men in completing the courses as well as bringing the men who work in the mines in closer contact with the higher officials who work in offices in the city.

Overall view of the speakers table.

Left, Arbuth Brown, Moffitt Mine, Hillman Coal & Coke Co. and right, P. J. Callaghan, retired Inspector, Pennsylvania Department of Mines.

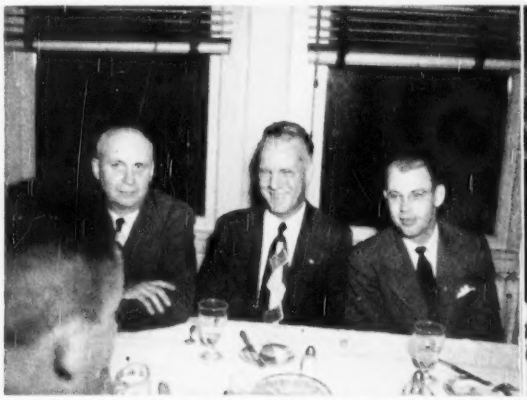
Left, Samuel P. Polack, U. S. Bureau of Mines, and right, John Rutherford, Superintendent, Washington Mine, Hillmann Coal & Coke Company.

Western Pennsylvania Bituminous Coal Operators Golf Association Closes 1949 Season At The Uniontown Country Club.

Francis McQuellen, Ass"t. to President, West Penn Power Company, entertaining after dinner. Singing in rear row are Frank Dunbar, and H. E. Pfeiffer. Seated in front row is Homer Chalfont, Superintendent, Ellsworth Mine, Republic Steel Corporation.

The Western Pennsylvania Bituminous Coal Operators Golf Association held its last party of the 1949 season at the Uniontown Sountry Club, Uniontown, Pennsylvania. Being the last party of the season, a large number of golfers and their friends were present. The first public showing of color motion pictures of the S. E. Gane and Company Fishing Party, at Put-In-Bay on Lake Erie, together with the showing of color pictures of previous golf parties also drew a large number of coal mine operating men, some of which attended a meeting of this group for the first time. The motion pictures afforded many of the golfers and fishermen the opportunity of seeing themselves in action. It also afforded their friends an opportunity to chide them, as their pictures appeared on the screen.

At the dinner it was decided to carry on the work of the Association in 1950. Members will be advised by mail, as usual, about the opening date.

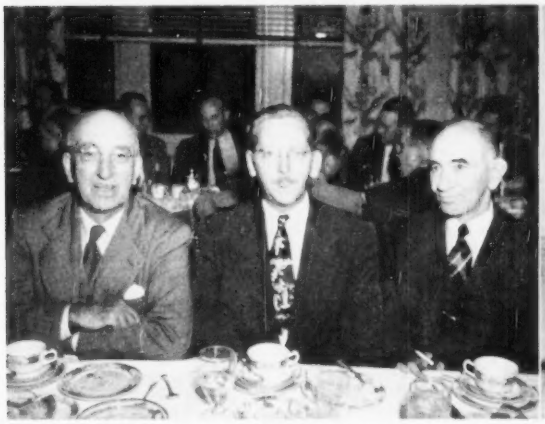


W. W. Dartnell, Supt., Gibson Mine, Hillman Coal & Coke Company; Paul M. Becker, Mine Safety Appliances Company, and Rolf Arentzen, Lee-Norse Company.

Walter A. Smith, Irwin Foundry & Mine Car Corporation, Frank Tomajko and A. R. Tomajko of the Tomajko Coal Company.

R. L. Killebrew, Westinghouse, George Buerger, Liberty Powder Company and Dave Thomas, Westinghouse.

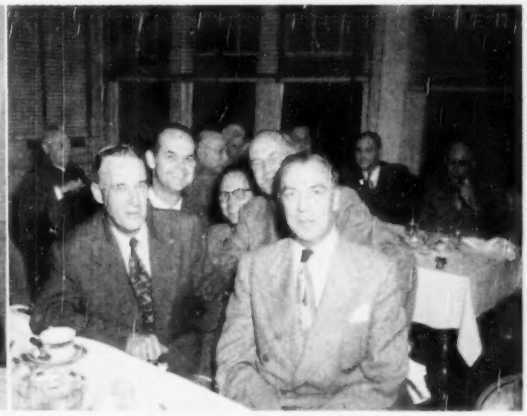
S. E. Gane, President, S. E. Gane and Company, H. G. Turner, Director of Personnel Frick Coke Company, and C. N. Replogle, President, Flood City Brass & Electric Co.



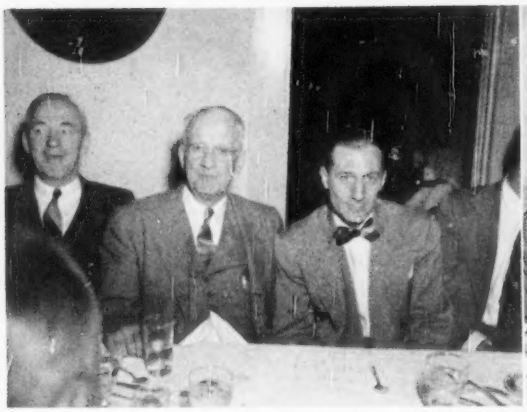
E. C. Mason, Superintendent, Bridgeport Mine, H. C. Frick Coke Company, L. E. Foster, Mfg's. Rep., and M. B. Girod, Superintendent, Robena Mine, H. C. Frick Coke Company.

L. to R.: H. A. McDowell, Ass't. Purchasing Agent and W. A. Davis, Purchasing Agent of Eastern Gas & Fuel Associates, and J. W. Kopchin, Sales Representative, Westinghouse Electric Corporation.

Jim Winning, Coal Department, Republic Steel Corporation, R. C. Beerbower, Jr., and R. C. Beerbower, Sr.



L. to R.: Front Row: A. D. Showalter, Vice President, Monongahela Rail & River Coal Company, and C. O. Crump, President, Brown-Fayro Co. Rear Row: J. W. Kotchin, J. B. McKelvey, and J. A. Malady.

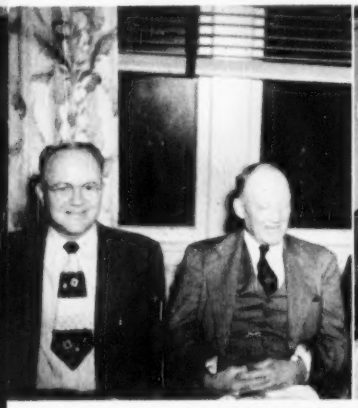


L. to R.: F. J. Bucher, Electrical Engineer, Hillman Coal & Coke Company, J. N. Orbin and E. L. Bartsch, Oliver Iron & Steel.

L. to R. Ed Lee, Lee-Norse Company, John Stephenson, Superintendent and Albert R. Hood, Production Engineer, Warwick Mine, Duquesne Light Company.

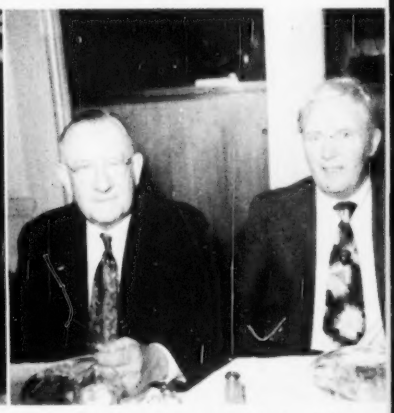
Herb Dunbar, President, Superior Mine Supply Company; Robert J. McGinnis, Kennametal Corporation, and J. R. Paulichek, Sales Representative, Interstate Engineers and Constructors.

Art Shannon, Fairmont Office, Jeffrey Manufacturing Company, Ed Johnson, Kennametal, Inc., and H. L. Griffin, Ventilation Engineer, Vesta Coal Company.

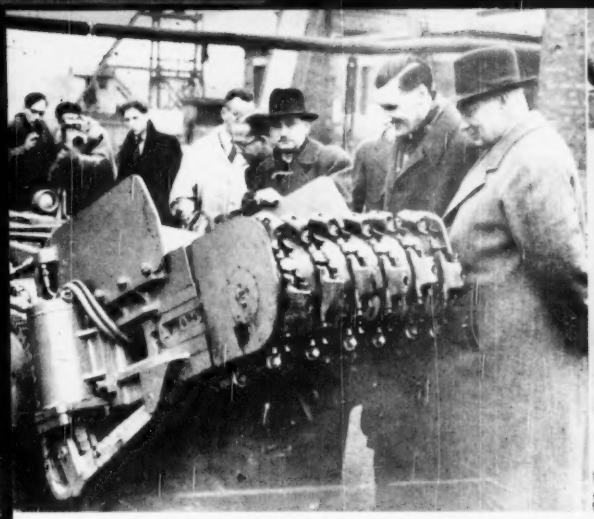


J. H. Truax, Superintendent, Harwick Mine, Duquesne Light Company, and Richard Shaw, Master Mechanic, Consumer's Mining Company.

R. D. Allison, Karl L. Kennerth, AA't. to President, H. C. Frick Coke Company, and C. W. Brasher, Penn Machine Company.



W. A. McBride, President, Jefferson Coal & Coke Company and J. A. Henry, Bortz Coal Company.



Point of interest is the first Joy Continuous Miner to leave the United States. The machine will soon go into operation at the Donisthorpe Colliery, Swadlincote, England. Viewing the machine, from right to left, Mr. R. T. P. Bell, representative of Joy's wholly-owned British subsidiary, Joy-Sullivan, Ltd., Mr. H. B. Bennett, manager of the Donisthorpe Colliery, and Mr. W. Unsworth, sub-area manager.

Earl Bradley, Joy serviceman from Staunton, Illinois, explains the action of the Continuous Miner's ripper-head and dust-control sprays to British miners at Donisthorpe Colliery. Mr. Bradley will give a course in the operation and maintenance of the machine before it is put into operation. In the background is one of the Joy 42-D battery shuttle cars, not yet assembled, which will operate behind the Continuous Miner.

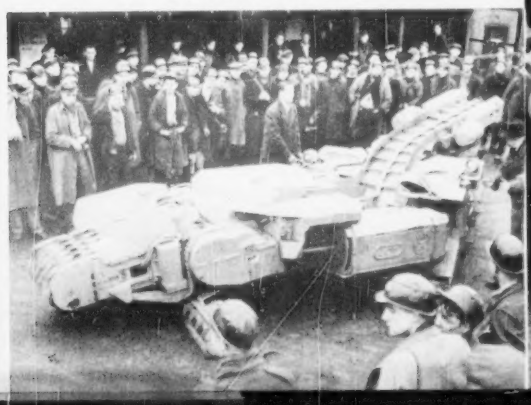
Joy Continuous Miner in England

The Joy Manufacturing Company, Pittsburgh, Pennsylvania, announces the demonstration of a Joy 3-JCM Continuous Miner at the Donisthorpe Colliery near Swadlincote, England.

This machine, the first to leave the United States, was demonstrated by Earl Bradley, a Joy serviceman from Staunton, Illinois, who will give the men at the mine a complete course in the operation and maintenance of the machine. After which the 3-JCM will be dis-assembled and lowered down the pit shaft, where it will be re-assembled and put into operation. The Continuous Miner will discharge into Joy 42-D battery Shuttle Cars.

Members of the British National Coal Board, after a thorough study of American mechanization methods, believe that the Joy Continuous Miner may be a partial solution to the troubles of the British Coal Industry.

An interested group of British miners surrounds Joy serviceman, Earl Bradley, of Staunton, Illinois, as he demonstrates the use of the Joy 3-JCM Continuous Miner. The machine is shown above ground at the Donisthorpe Colliery, Swadlincote, England.



British miners study a Joy 3-JCM Continuous Miner which will shortly go into operation at their mine. In the background can be seen the shaft head of the Donisthorpe Colliery near Swadlincote, one of the finest mines in England.

Side-Dump Euclids

DO A WIDE RANGE OF WORK

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High speed is maintained with a load of 12.8 bank yards of heavy excavation at an airport job in Tennessee.

Low, wide hopper speeds loading and reduces spillage at an open-pit coal mining operation in West Virginia.

THE Side-Dump Euclid is a versatile hauling unit with a wide range of usefulness on the toughest off-the-highway jobs. Its big trailer body assures easy loading and has a capacity of 20 tons . . . a 200 h.p. diesel engine provides speed and power for high production at low cost.

Euclid twin hydraulic hoists raise the body and its 40,000-lb. payload fast . . . down-folding gates open automatically when the body is raised . . . either right or left dumping can be selected by the operator. High dumping angle and smooth interior assure fast, non-stop shedding of loads over the edge of fills and waste banks or in even windrows on the fill.

The Side-Dump Euclid is engineered as a complete unit and is ruggedly constructed for hauling rock, ore, overburden, and other heavy excavation. The big 24.00 x 25 tires on drive and trailer wheels give good flotation and traction on soft fills and difficult haul roads.

Your Euclid Distributor will be glad to discuss the many advantages of Side-Dump Euclids for your off-the-highway hauling jobs . . . call or write today.

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

EUCLIDS *Move the Earth*

(Continued from page 13)

may be emitted from the coal bed or surrounding strata. Sweeping the face continuously implies, of course, that an adequate volume is available in the last open crosscut and that the air is conducted effectively from the last crosscut to the face. Line curtain or an auxiliary fan with tubing are devices available for conducting the air. Although these devices have been used for a number of years and their correct application is well known, in some instances they are applied incorrectly. Such practices may be the direct or contributing cause of an explosion and the prelude to antagonistic legislation.

Let us consider an example of inadequate face ventilation—a 3-entry development in which the faces are advanced by continuous mining equipment. Coal is transported by shuttle cars and a belt conveyor. The center and left entry have been advanced 60 feet beyond the last open crosscut. Flame-safety-lamp tests indicated methane at the faces of these unventilated "dead-ends," and laboratory analyses of air samples confirmed the presence of about 0.9 per cent methane. The advancing face was ventilated by recirculated methanous air from an improperly located permissible auxiliary fan unit. The hazardous practices could be eliminated by placing the auxiliary fan in the left entry outby the open crosscut and conducting air to the face of each place. An ample volume of air (11,000 c.f.m.) was available, but the officials in charge failed to use the available devices properly to conduct the air to the faces.

Let's take another example of inadequate face ventilation resulting from too many brattice-cloth stoppings and the air leakage incident thereto. Although an ample volume of air (12,000 c.f.m.) was available at the intake to the area, only 1,100 c.f.m. was ventilating the face being advanced by the continuous mining equipment. The line curtain was about 20 feet from the face, and the air issuing from the curtain did not reach the face. The loss in volume was due to leakage through seven brattice-cloth stoppings and one check curtain. A more substantial type of stopping should be used and the movement of mobile equipment so arranged as to eliminate the use of check curtains. A sample of air collected at the face contained 0.54 per cent CH_4; however, such a concentration may not have been present if the face had been ventilated adequately. Here again, as in the previous example, the devices for coursing the air to the face were not used properly.

Effective face ventilation requires that an adequate volume of air sweep the face continuously. Many persons think it necessary to maintain a line curtain within 10 feet of the face to accomplish this, but it is not necessarily so. Furthermore, the shape and size of continuous mining equipment prevent the maintenance of a line curtain so close to the face. In low coal the Joy Continuous Miner itself acts as a curtain; in high coal the action is less pronounced but yet somewhat effective.

Experience shows that good face ventilation is possible with a line curtain as much as 20 feet from the face, provided the velocity of the air leaving the line curtain is 200 or more feet per minute. At such a distance, the curtain does not interfere with the operation or movement

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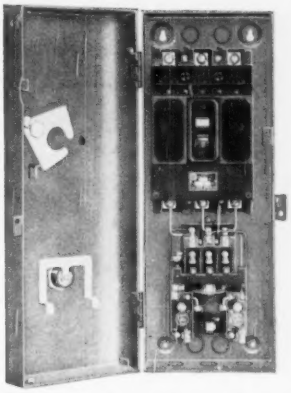
A COAL MINE'S RUGGED Requirements for Both INSIDE AND OUTSIDE Applications



Clark 6020—Size 1 Form MA Starter in NEMA Type 1 Enclosure—open view.

All controls have husky Magnetic Contactors. Motors are protected from unsafe overloads by Clark Overload Relays. Circuit Breakers are available for more positive short circuit protection.

Starters may be had in a variety of NEMA enclosures, and in addition, explosion proof D.C. Starters are available, suitable for use on permissible assemblies.

HEAVY DUTY PILOT DEVICES for all Types of Applications are also to be had including Push Buttons and Float and Limit Switches.

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of the equipment or with the operator. The area of the space behind the curtain must be adjusted to suit the volume of air flowing.

The use of an auxiliary fan in lieu of line curtain in advancing places with the Joy Continuous Miner is not justifiable, but is necessary in connection with the present design of the Jeffrey Colmol and the McKinlay Entry Driver. The size and shape of the two latter machines prevent the erection of line curtain in a position suitable to provide adequate face ventilation. However, impending changes in design of these machines may rectify this situation in the near future.

Other safety problems in connection with the operation of continuous mining equipment, in addition to ventilation, do not differ essentially from those with other types of face equipment. The problems may vary slightly according to the type of equipment used, but basically they are (1) roof support and testing, (2) gas testing, (3) allaying dust, (4) maintaining visibility, (5) preventing arcs and sparks, (6) rock dusting, (7) mechanical safeguards, and (8) preventing spillage.

1. It is claimed that roof conditions are improved by using continuous mining equipment because blasting has been eliminated. No doubt there has been some improvement, but certainly the equipment cannot make "bad" roof "good." Furthermore, to date most of the units have been used under roof conditions that might be termed good. Therefore, complete justification for the claim should await more experience. Even though roof conditions are improved, the precautions taken in connection with conventional mining methods should not be relaxed. The same general rule should be applied to continuous mining equipment: that is, determine the condition of the roof as soon as possible after exposure; and immediately install the proper type and required number of supports. The roof should be tested at frequent, regular intervals, and the type and number of supports must be determined by a thorough analysis of local conditions and action of the roof strata.

2. Testing for gas is important, even in so-called nongassy mines. Methane may be emitted at any time, and in the absence of adequate ventilation an explosive atmosphere may form in a short time. Tests for gas at the face cannot be made while continuous mining equipment is in operation; consequently, it must be stopped periodically to do so. It is advisable to augment such procedure by suspending a flame safety lamp near the operator so that he can glance at it frequently, or a continuous methane alarm might be used. A commercially available alarm can be used satisfactorily if modified slightly. In gassy mines, gas testing procedures (manual or automatic) should be established and enforced rigidly.

3. The problem of allaying dust before it becomes air-borne has not been solved as yet. Considerable experimentation is being done with various types and combinations of sprays, wetting agents, and water pressures. A satisfactory solution should be announced in the near future.

4. Visibility at the face is essential. The operator must be able to see the face at all times to control the progress of his machine properly. By arranging coursing of the air so that the intaking current passes over the operator before reaching the face, the face may be kept reasonably free of excess dust.

Eating up overburden at the rate of two cubic yards a bite, the OSGOOD Model 1006 Stripping Shovel gets down to seam in a hurry! Built BIG from tracks to boom tip, yet easy to operate . . . OSGOOD Air Control of every motion provides swift, smooth, precise operation that gets more work done in less time.

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5. Preventing arcs and sparks in and around the equipment may or may not be difficult, depending on the source. Arcing is common when two pieces of mobile electric equipment touch, and the intensity of such arcs may be enough to ignite an explosive mixture. It is fundamental that a difference in potential must exist for current to flow from one piece of equipment to another, thereby forming an arc. Therefore, it is essential to have all pieces of equipment at the same potential, preferably at earth potential.

One solution is to have a continuous electrical path between the various mobile units comprising mining equipment set-up. This may be unwieldy in most cases and impractical in some; consequently, the real solution is to prevent the fault currents that cause the difference in potential. This can be done by using electric conductors of a size adequate for the duty imposed, installing them in a workmanlike manner, and maintaining them in good condition at all times. Devices are available that will indicate fault currents of as little as 2 amperes by deenergizing the power circuit. This type of device is furnished with some continuous mining equipment, but some machine operators disconnect them when power interruptions occur too frequently because of fault currents, thus having production take precedence over safety. On the other hand, the frequency of fault currents may be due to the use of inferior quality materials furnished by the manufacturer. Either or both should not be tolerated by the coal-mining industry.

6. Maintaining rock dust within the proper distance of the face is a formidable safety problem because suitable rock dust distributors are available. The amount of rock dust required per linear foot of entry driven by the Joy Miner is about 10 per cent more than the amount required in entries of comparable cross section driven by other types because of the serrated ribs formed by the machine.

7. Continuous mining equipment, as built by the manufacturer, is complete with the necessary mechanical safeguards except for locking devices for the cutting and boring heads to prevent accidental contact therewith. Suitable devices may be built in the local mine shop.

8. Spillage by the Joy Miner is a safety problem not presented by either the Colmol or the McKinlay. The Joy Manufacturing Co. is experimenting with devices to prevent excessive spillage, and suitable devices should be available in the near future. Meanwhile, manual labor, mobile loading machines, and duckbill conveyors are being used to clean up spillage, but in some mines such material is not removed. The depth of the spilled material bears no apparent relationship to the thickness of the coal bed. It consistently ranges from 6 to 8 inches. In low coal it is a serious problem because of the reduction in headroom.

Permitting spillage to remain on the floor is hazardous because a large part of this material would enter into and propagate a dust explosion. Screen analyses of samples of spillage indicate that the minus 20-mesh material may be as much as 49 per cent. Thus, the magnitude of the hazard is obvious, as well as the volume of rock dust required to render it inert.

In conclusion, it should be reemphasized that continuous mining equipment has not introduced any new ventilation or safety problems in the mining of bituminous coal but that corrective measures must be applied promptly to avert accidents or disasters, and to forestall restrictive or antagonistic legislation.

Product Uniformity

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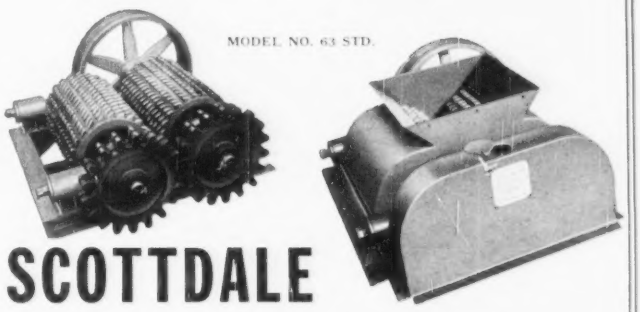

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Uniform coal products at a saving in power consumption . . . an actual fact with the Scottdale double-roll Coal Crusher that features an efficient shredding action on the coal by means of toothed double-rolls assembled in a staggered position.

The Features . . .

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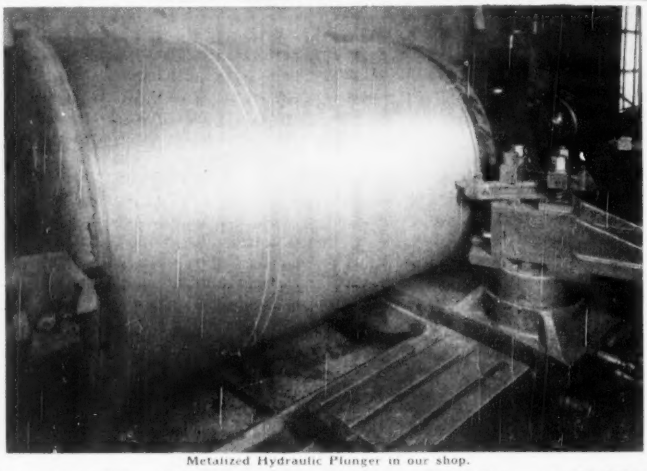

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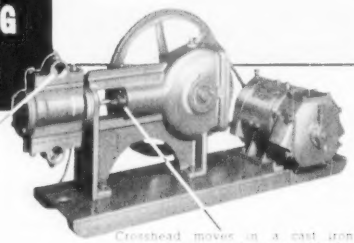

Suction and discharge chambers can be turned to meet existing pipe connections.

Crosshead moves in a cast iron sleeve that is easily renewable for economic maintenance.

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SPECIFICATIONS: Thoroughly guarded V-belt drive. Total weight with 1 H.P. motor 375#; Length 42"; Height 22"; Width 17" over motor. Dimensions can be adjusted to meet individual conditions.

A sturdy, compact, plunger type pump that is light enough to be moved about the mine. OTHER OUTSTANDING FEATURES: All moving parts are self-oiling and sealed against leakage and dirt. . . . Double-acting, reversible water end is furnished in acid-resisting bronze or chrome steel. . . . Easily replaced valve seat plate, reversible for double life. . . . Leather cup-type piston gives long life and high efficiency as well as low replacement cost.

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JOHNSTOWN, PA.

Branch Office:

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Personnel Changes

MYRON R. COUGHENOUR
Engineering Manager
Connellsville Mfg. & Mine Supply Co.

Mr. Myron R. Coughenour has been appointed Engineering Manager of the Connellsville Manufacturing and Mine Supply Co., Connellsville, Pa., succeeding Mr. W. L. Pritts, Jr., who is no longer with the company. Mr. Coughenour returns to the Connellsville Manufacturing and Mine Supply Co. after having served 22 years with The Pittsburgh Consolidated Coal Co., and The Fairmont Machinery Co., in various engineering capacities.

The Joy Manufacturing Company, Oliver Building, Pittsburgh, Pa., has announced the appointment of Paul M. Barlow as Manager, Mining Sales, Mines Equipment Division of Joy.

Mr. Barlow, a 1932 graduate of Carnegie Institute of Technology, spent eleven years as an electrical engineer with the West Virginia Engineering Company, the West Virginia Department of Mines, and the Carbide and Chemical Corporation. He then joined the Mines Equipment Division as a sales engineer, rising from this position to Manager, Mining Sales.

Mr. Barlow is a registered Professional Engineer with membership in the A.I.E.E. and the A.I.M.E.

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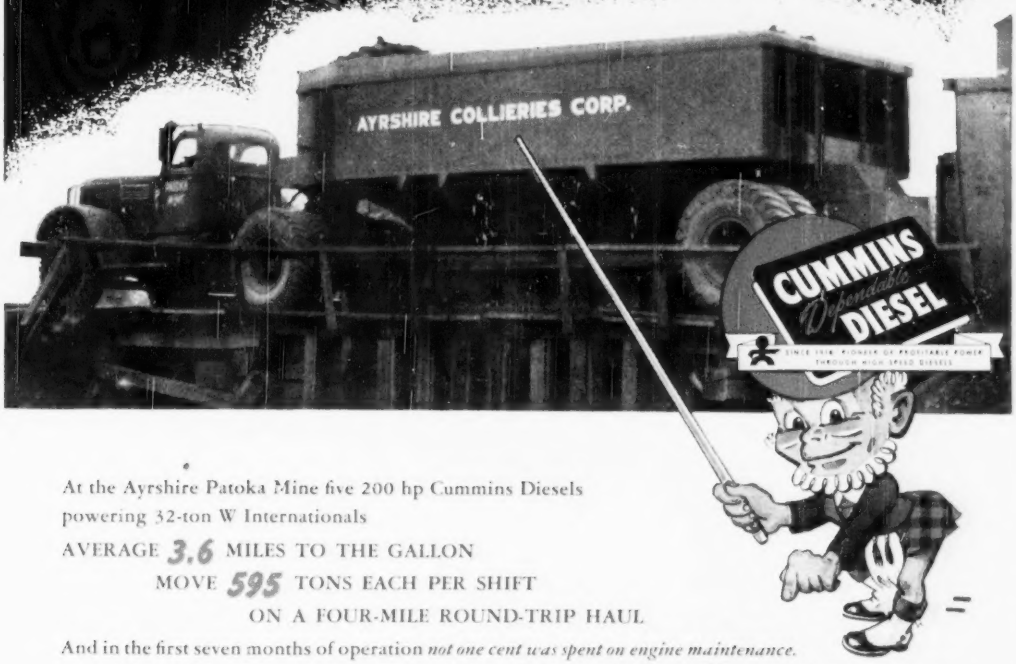
By Standardizing on CUMMINS



At the Ayrshire Patoka Mine five 200 hp Cummins Diesels powering 32-ton W Internationals

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MOVE **595** TONS EACH PER SHIFT

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At six Ayrshire Collieries Corporation Indiana-Illinois strip mines **55** coal haulers are powered with **Cummins *Dependable* Diesels.** Cummins Power is used exclusively because Ayrshire engineers are convinced that Cummins Diesels move more coal for less cost.

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SERVICE—One of the more than 200 Cummins Dealers is as close as your phone!

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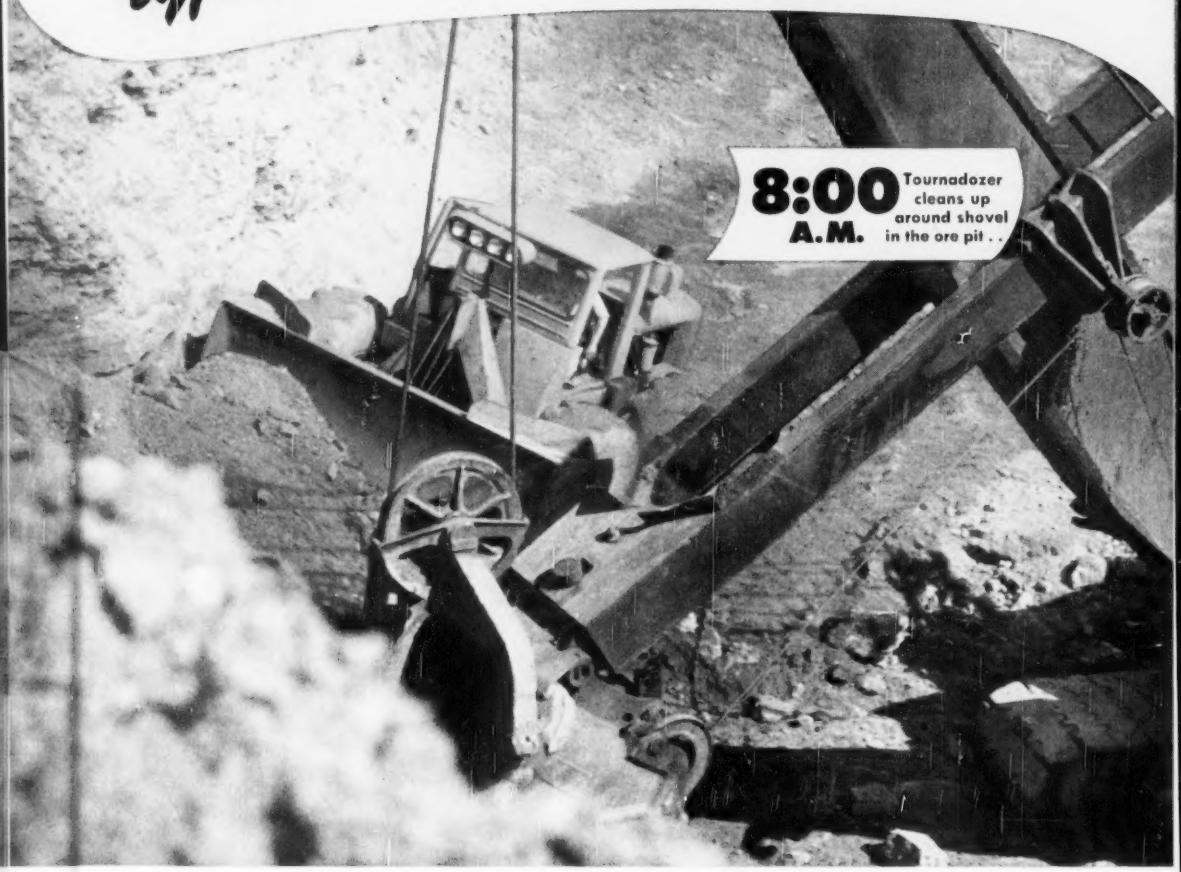
Here's a typical TOURNADOZER



AT Biwabik, Minnesota, Stanley Mining Company operates an ore pit, crusher, and washing plant 24 hours a day, 7 days a week. They are mining heavy rock, mixed with banded taconite, which must be crushed, screened, then processed to recover iron ore. On this multi-handling operation, they have a lot of widely-scattered dozer jobs . . . and have found the answer in a LeTourneau high-speed, rubber-tired Tournadozer. Above photos show how its fast, "run-about" ability helps Stanley Mining Company maintain steady, balanced production of pit and plants.

Tournadozer's principal job is handling clean-up around the ore shovel. It utilizes normal waiting periods to maintain the rock dump . . . cleans spillage at the crushing plant . . . feeds material from surge pile to hopper. Tournadozer gets there, gets each job done, and gets back to shovel FAST. It's also readily available at a moment's notice to clean second-growth timber ahead of a self-propelled rock drill . . . "lends a hand" whenever the crusher plant crew makes screen adjustments . . . builds and maintains haul roads.

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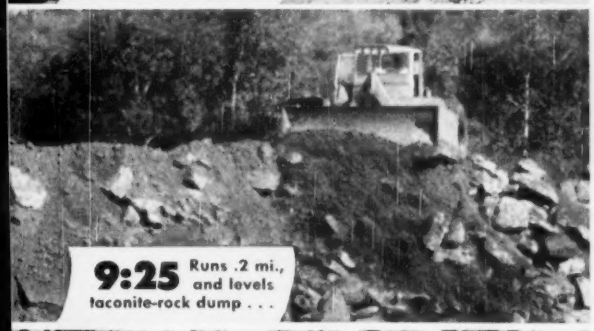
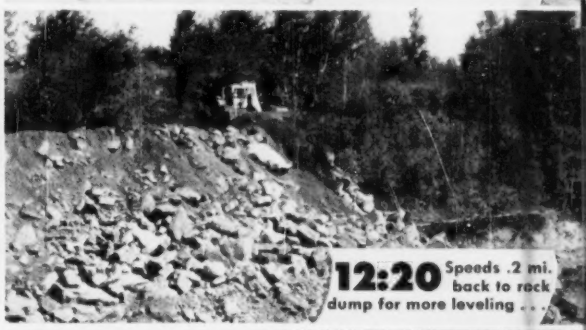
8-HOUR SHIFT *at Stanley Mining Co.*

8:48 Travels .4 mi. to the crusher, cleans up drain spillage

11:55 Feeds material from surge pile to hopper at crushing plant

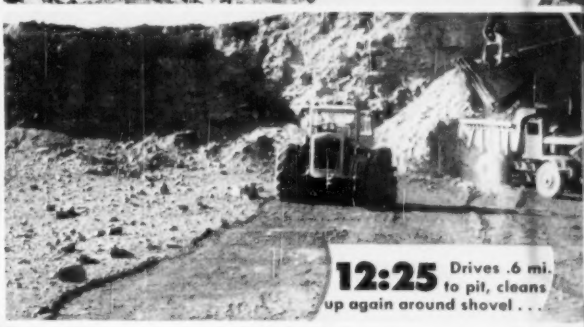


9:25 Runs .2 mi., and levels taconite-rock dump . . .



12:20 Speeds .2 mi. back to rock dump for more leveling . . .

9:34 Returns .6 mi. to pit for more clean-up at the shovel



12:25 Drives .6 mi. to pit, cleans up again around shovel . . .

11:45 Drives .4 mi. to help crew adjust screen at crusher

3:45 P.M. Goes .4 mi. to surge pile, feeds hopper. Next shift, 4:00 to 12:00.

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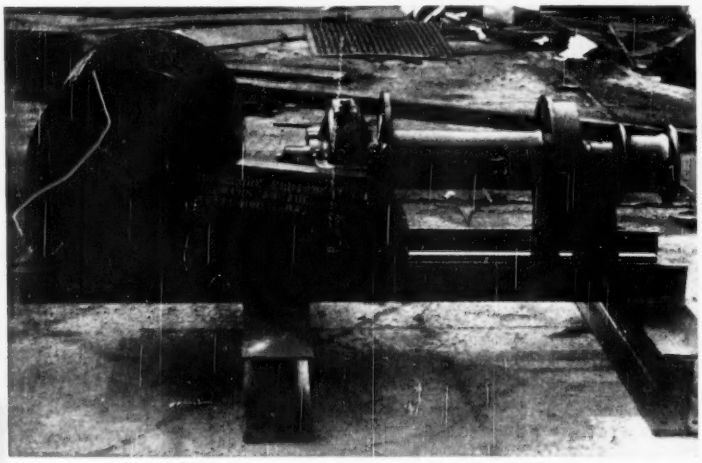

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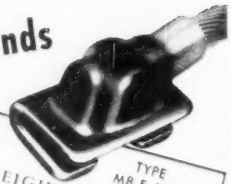

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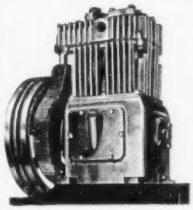

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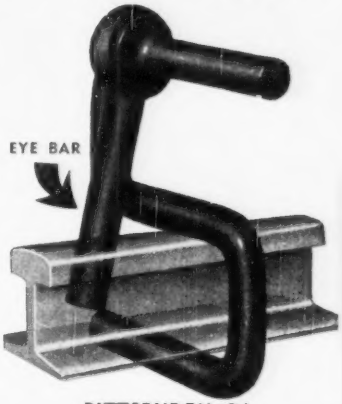

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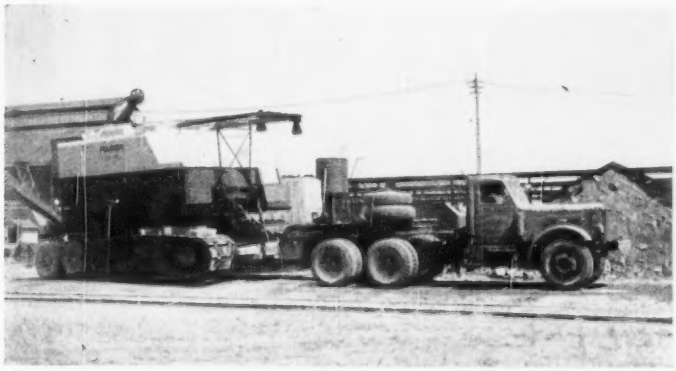

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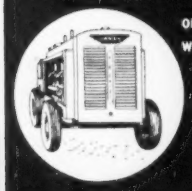

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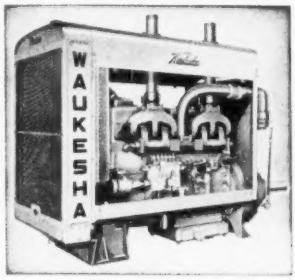

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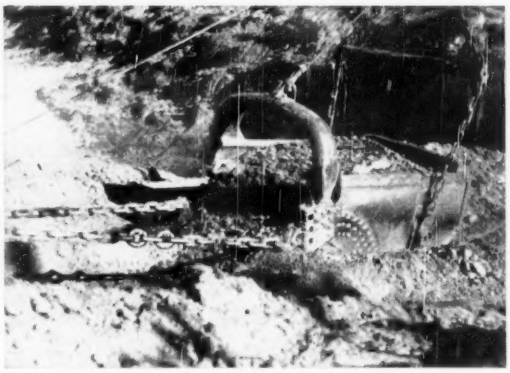

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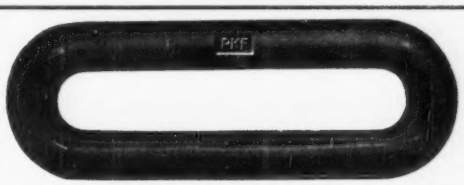

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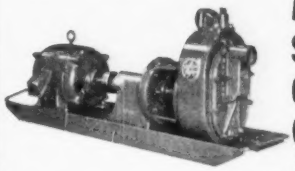

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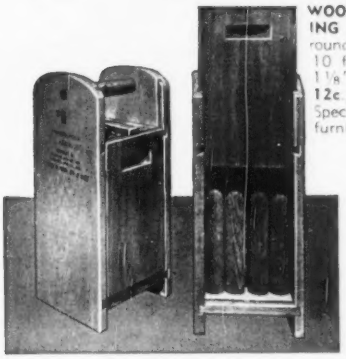

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1	100	Westinghouse	600
1	100	General Electric	1800
1	100	Reliance	580
1	100	Delco	1200
2	90	Westinghouse	680
4	75	Westinghouse	720
1	75	Westinghouse	1200
1	60	Westinghouse	1200
1 NEW	50	General Electric	1800
3	40	Westinghouse	900
2	30	Westinghouse	720

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1—100 kw. G.E. 125 v. 900 rpm. 220/440 v. 3 ph. 60 cy. AC Syn.

1—125 kw. G.E. 125 v. 1200 rpm. 220/440 v. 3 ph. 60 cy. AC.

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D.C. Generators—250 v. D.C.

No.	KW.	Make	Speed
1	250	West.	1200
1	175	G. E.	700
2 New	135	G. E.	1150
1	125	West.	580
1	125	Allis-Chal.	1150
1	110	West.	700
1	100	Allis-Chal.	1150
1	75	West.	750
1	40	G.E.	720

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1	450	Elec. Machy.	120

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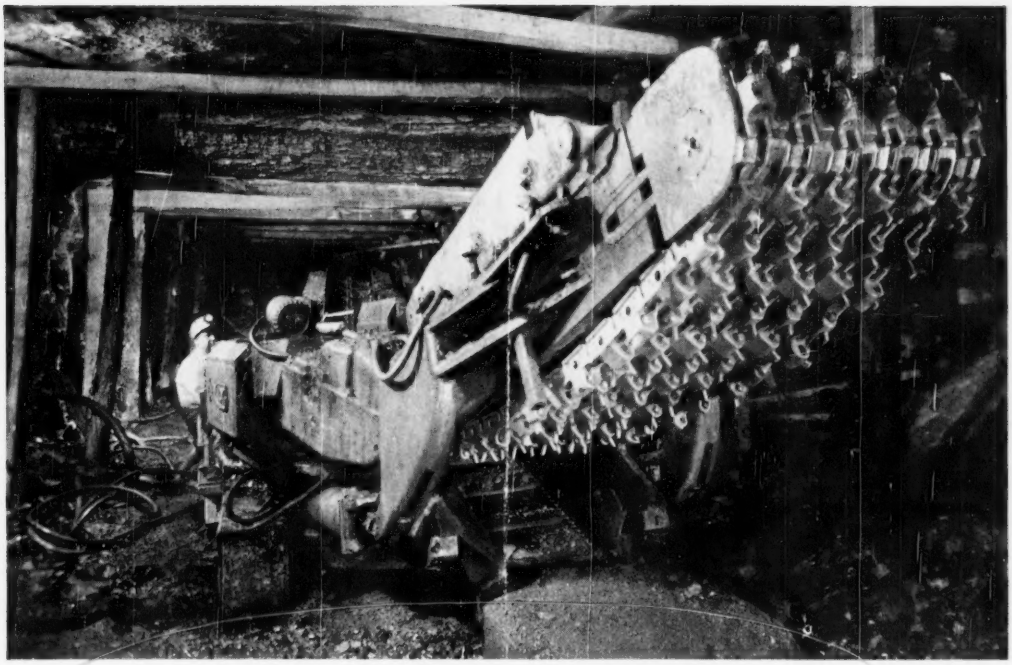

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